

Traveling Ionospheric Disturbances Observed Using Doppler Measurements of Clear-Channel AM Broadcast Transmitters

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HamSCI Workshop 2020

Original proof-of-concept (2012):

Detection of Traveling Ionospheric Disturbances by Medium Frequency Doppler Sounding Using AM Radio Transmissions

M. Chilcote,¹ J. LaBelle,¹ F. D. Lind,² A. J. Coster,² E. S. Miller,³ I. A. Galkin,⁴ and A. T. Weatherwax⁵

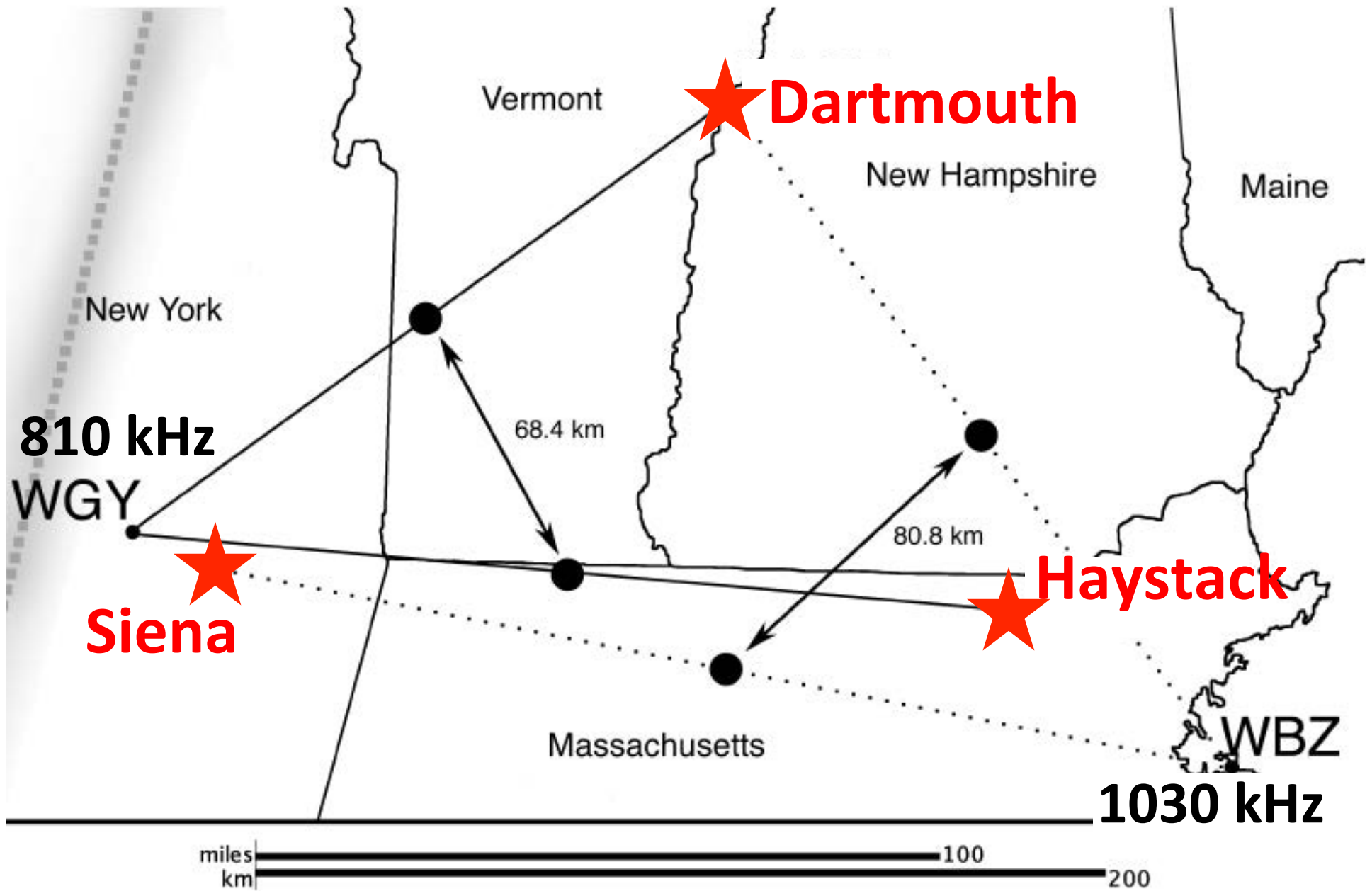
Published AGU Radio Science, 2015

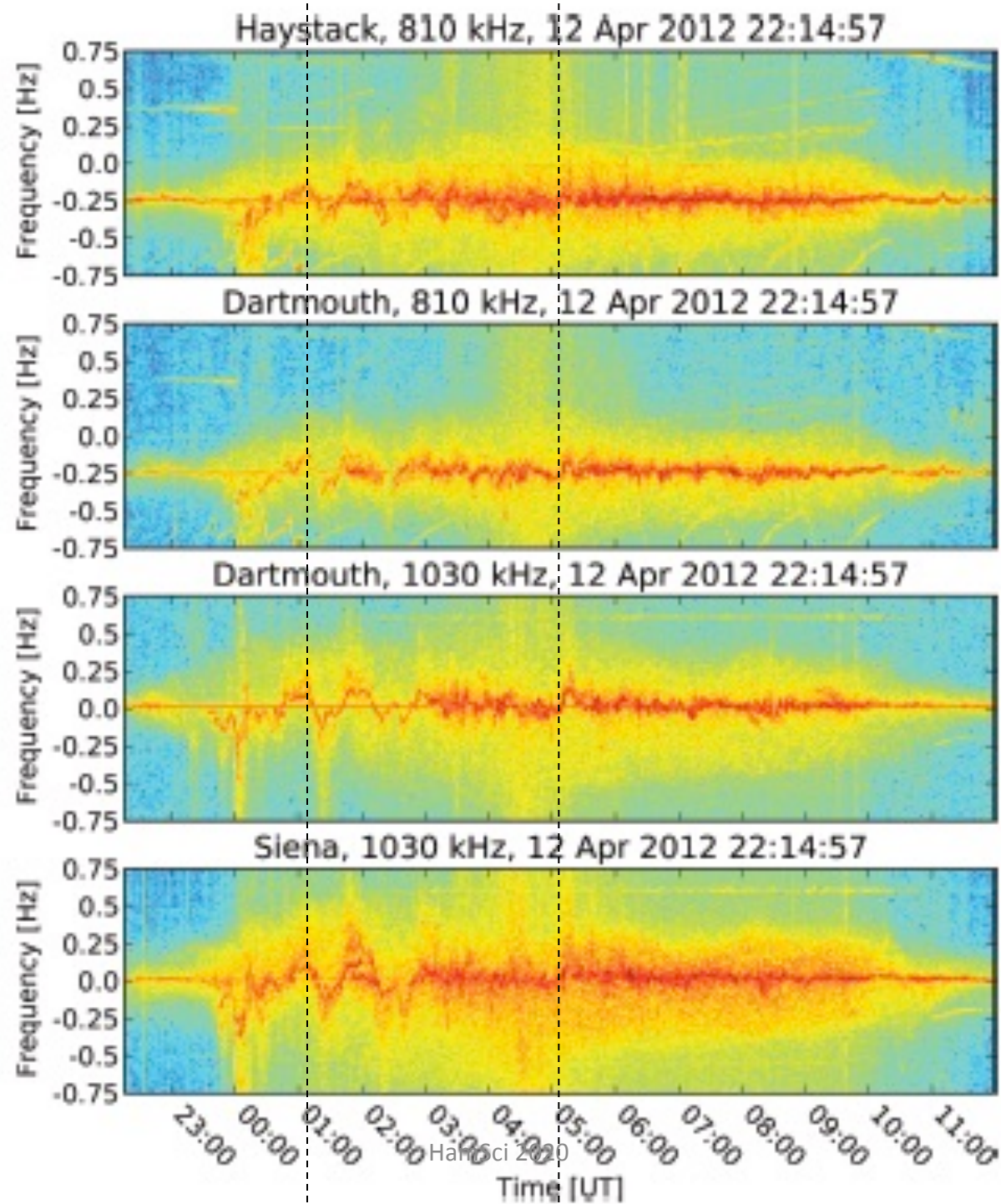
Undergraduate students at Dartmouth:
Eldred Lee (Fall, 2014), Eric Tao (Winter, 2015)

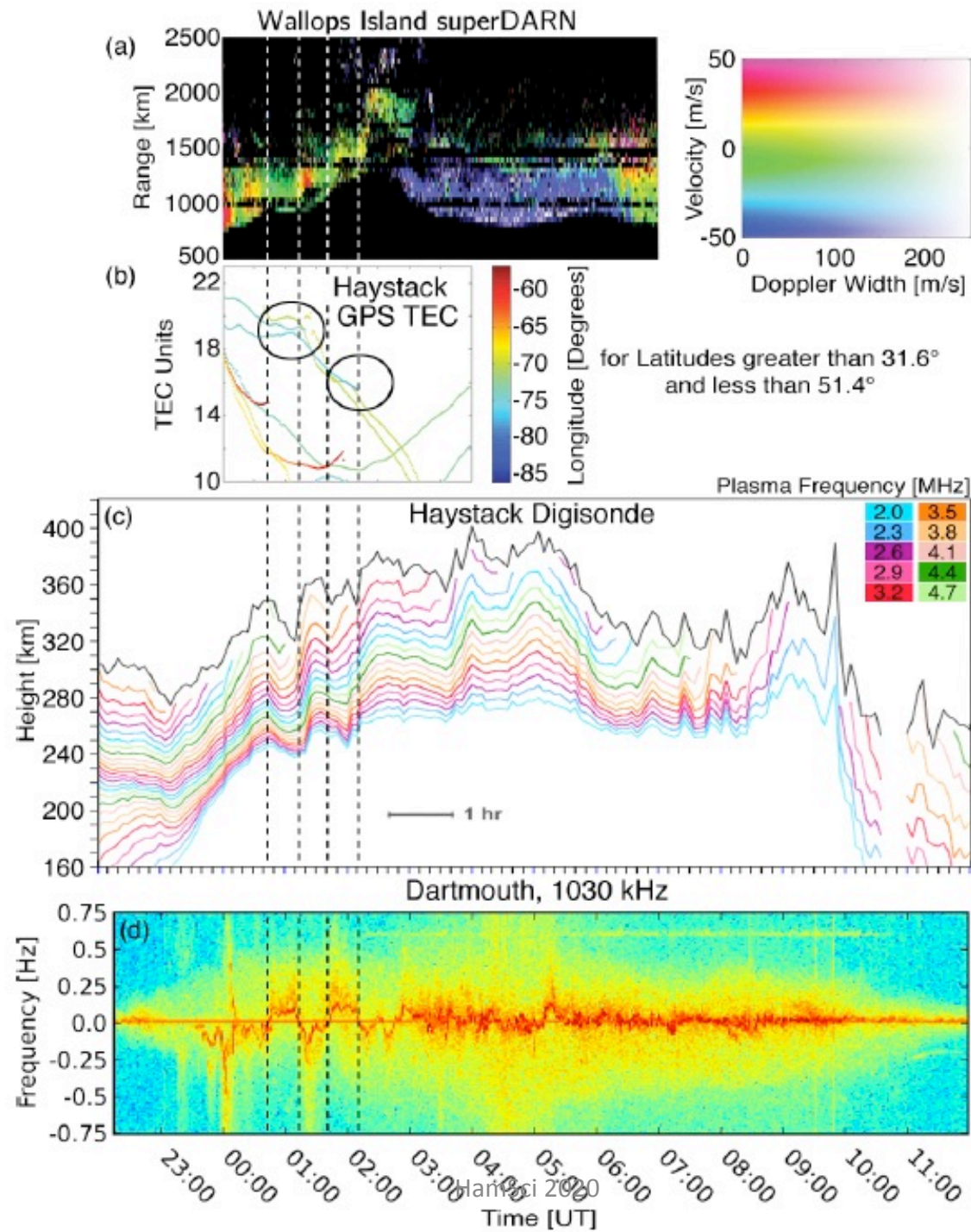
Using MIT Haystack ISIS receivers
with help from J. Vierinen



Original Antenna

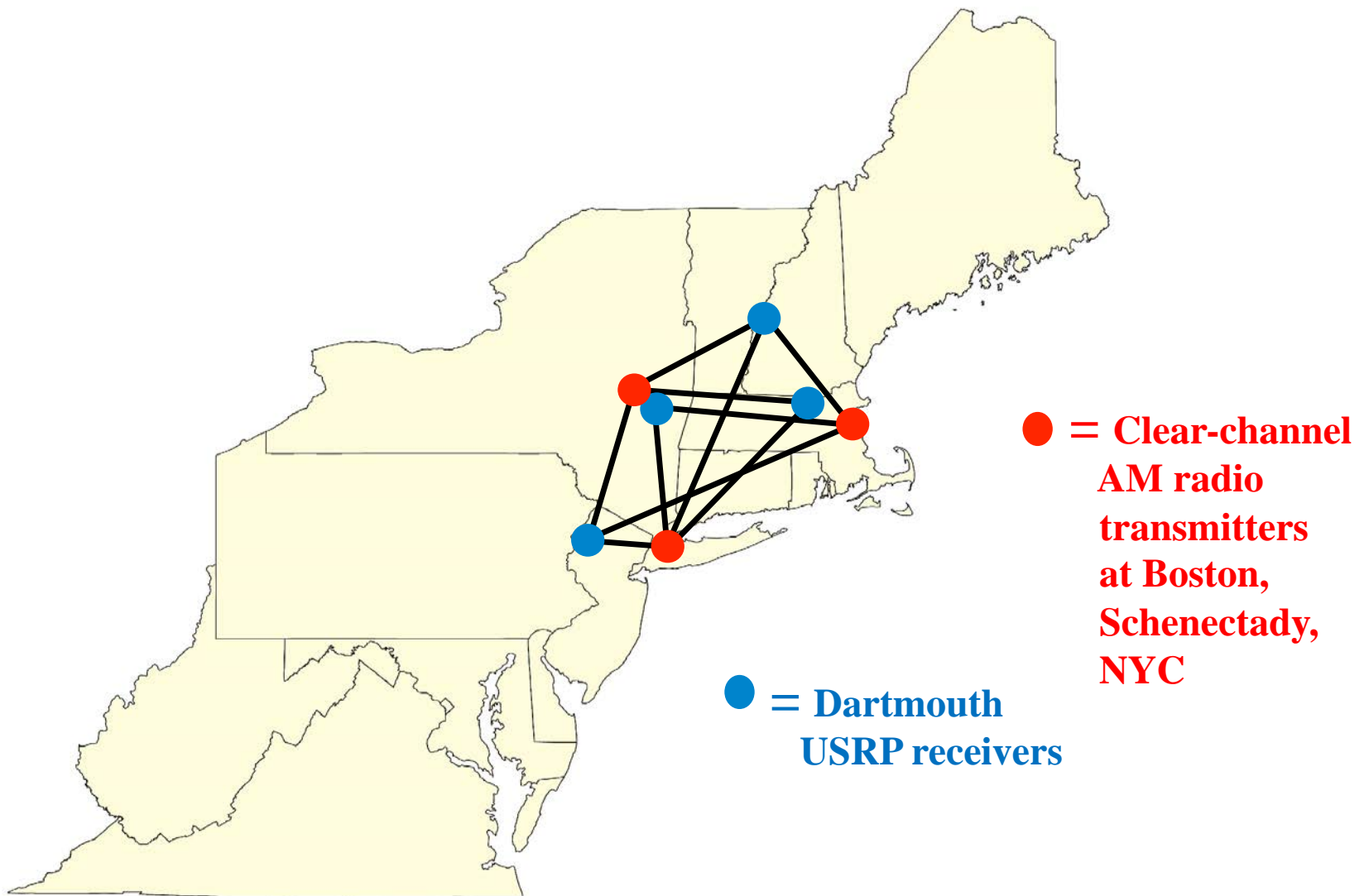


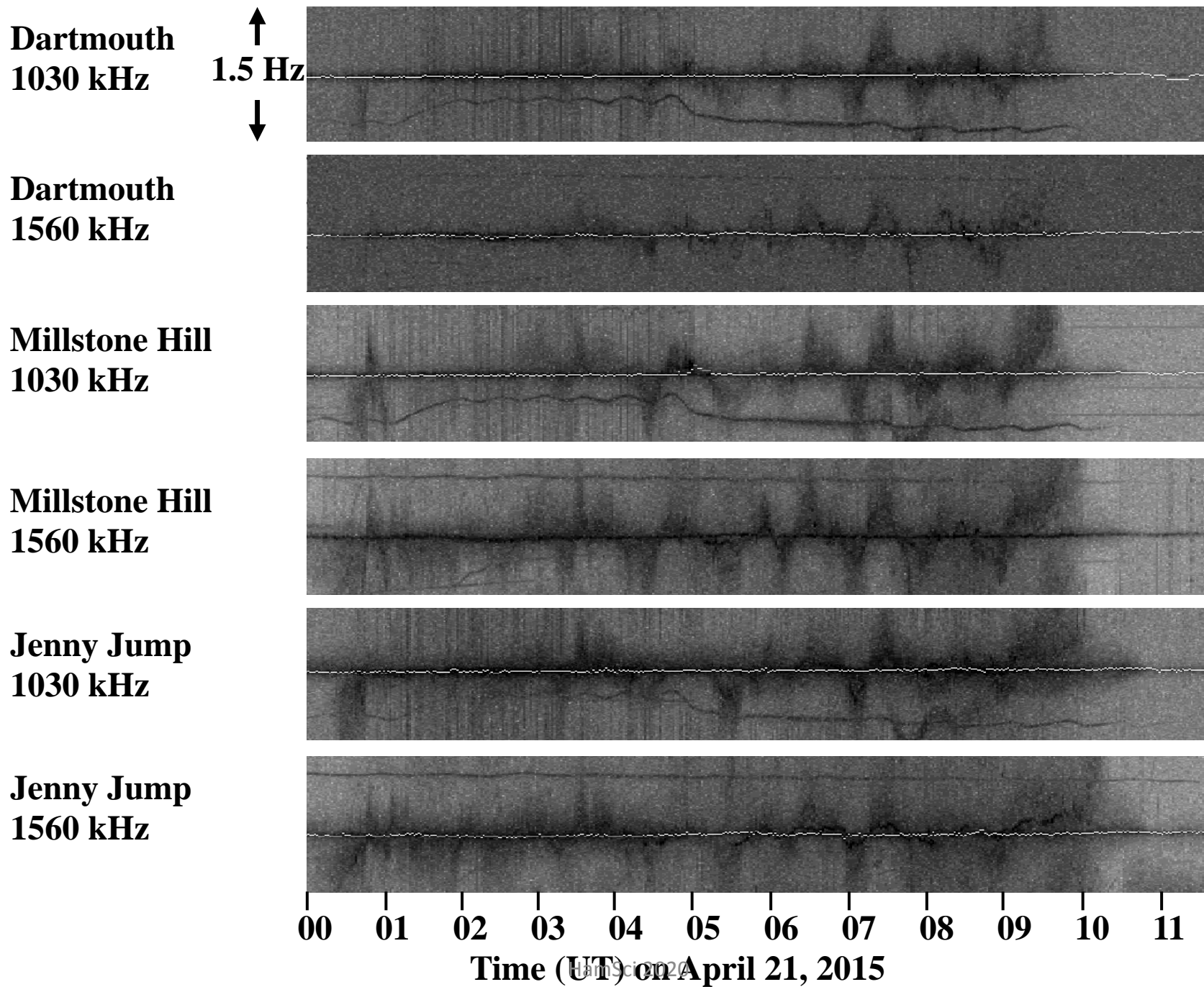






New Antenna





Hamvention 2019



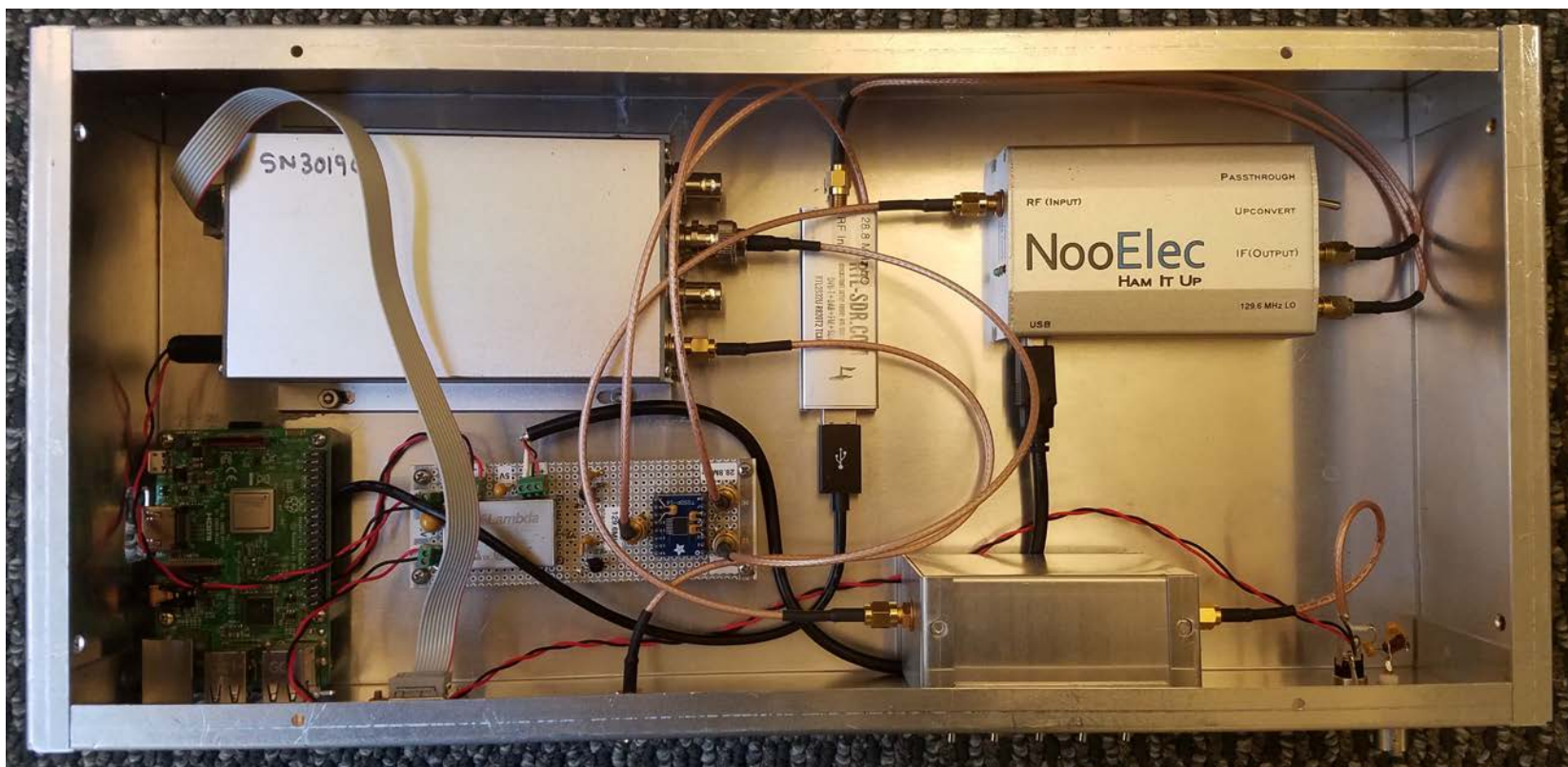
Dartmouth AM Doppler Receiver



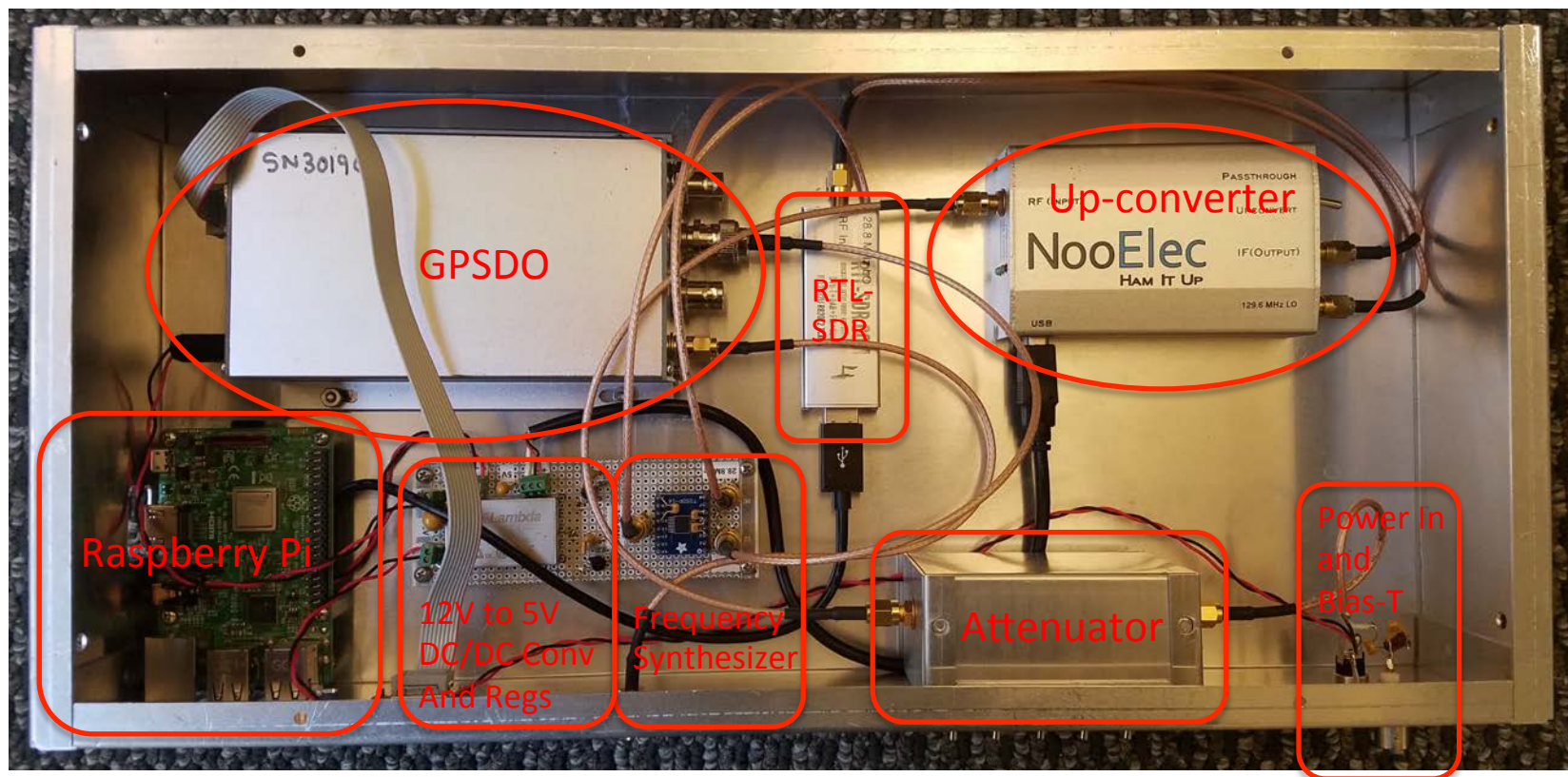
Dartmouth AM Doppler Receiver, front panel



Dartmouth AM Doppler Receiver, inside



Dartmouth AM Doppler Receiver, components



Receiver Sites

AMD2: Dartmouth College, Hanover, NH

AMD3: Schenectady, NY (MIT Haystack)

AMD4: Jenny Jump, NJ (NJIT)

AMD5: UMass Dartmouth

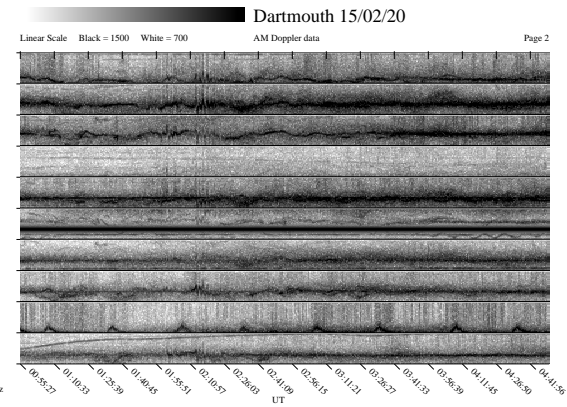
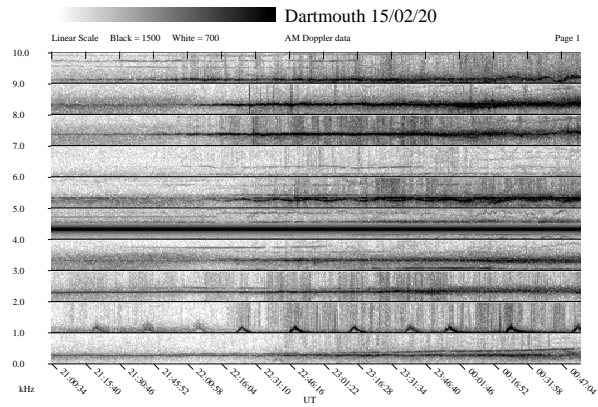
AMD6: Cornell

AMD7: Massena, NY (pending)

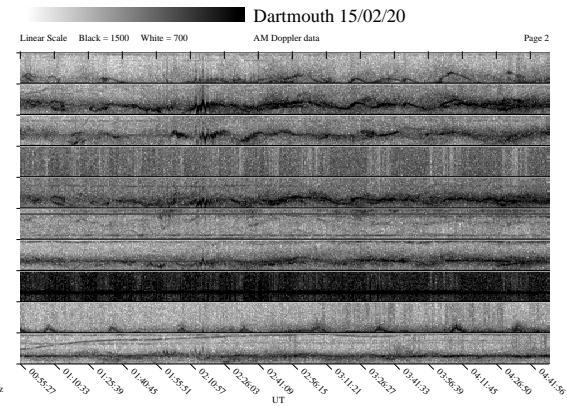
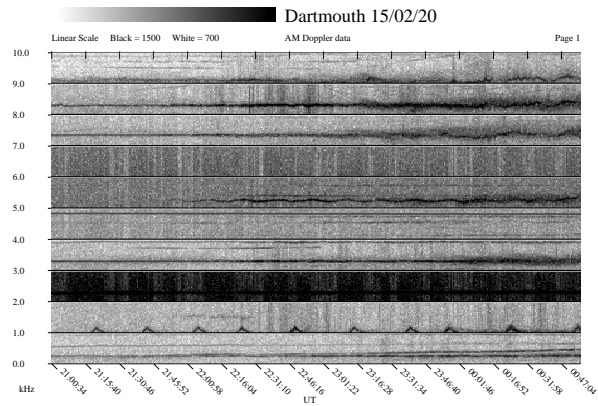
AM Radio Channels Monitored (order from bottom of plots)

- | | | | |
|-----|----------|----------------|---------------|
| 1. | 690 kHz | CKGM | Montreal |
| 2. | 770 kHz | WABC | New York City |
| 3. | 810 kHz | WGY | Schenectady |
| 4. | 880 kHz | WCBS | New York City |
| 5. | 900 kHz | Reference Tone | |
| 6. | 1010 kHz | CFRB | Toronto |
| 7. | 1030 kHz | WBZ | Boston |
| 8. | 1080 kHz | WTIC | Hartford, CT |
| 9. | 1130 kHz | WBBR | New York City |
| 10. | 1560 kHz | WFME | New York City |

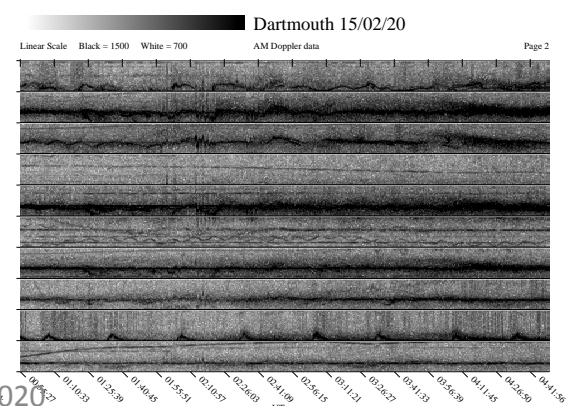
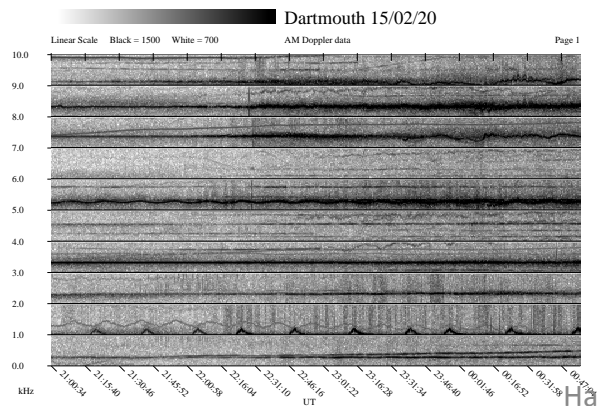
AMD2
Dartmouth



AMD3
Schenectady



AMD5
UMass
Dartmouth



AMD2 Dartmouth

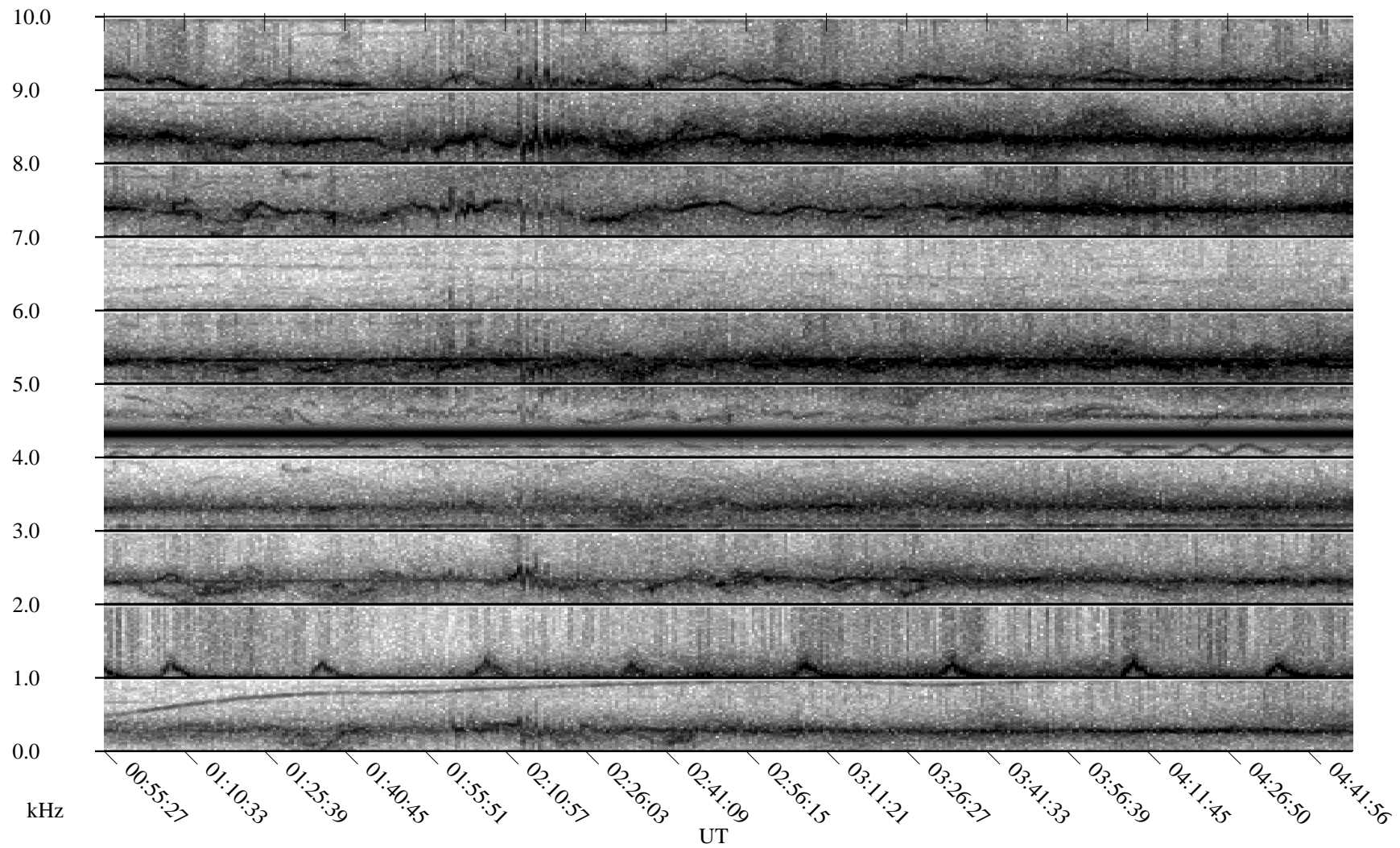


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Linear Scale Black = 1500 White = 700

AM Doppler data

Page 2



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AMD3 Schenectady

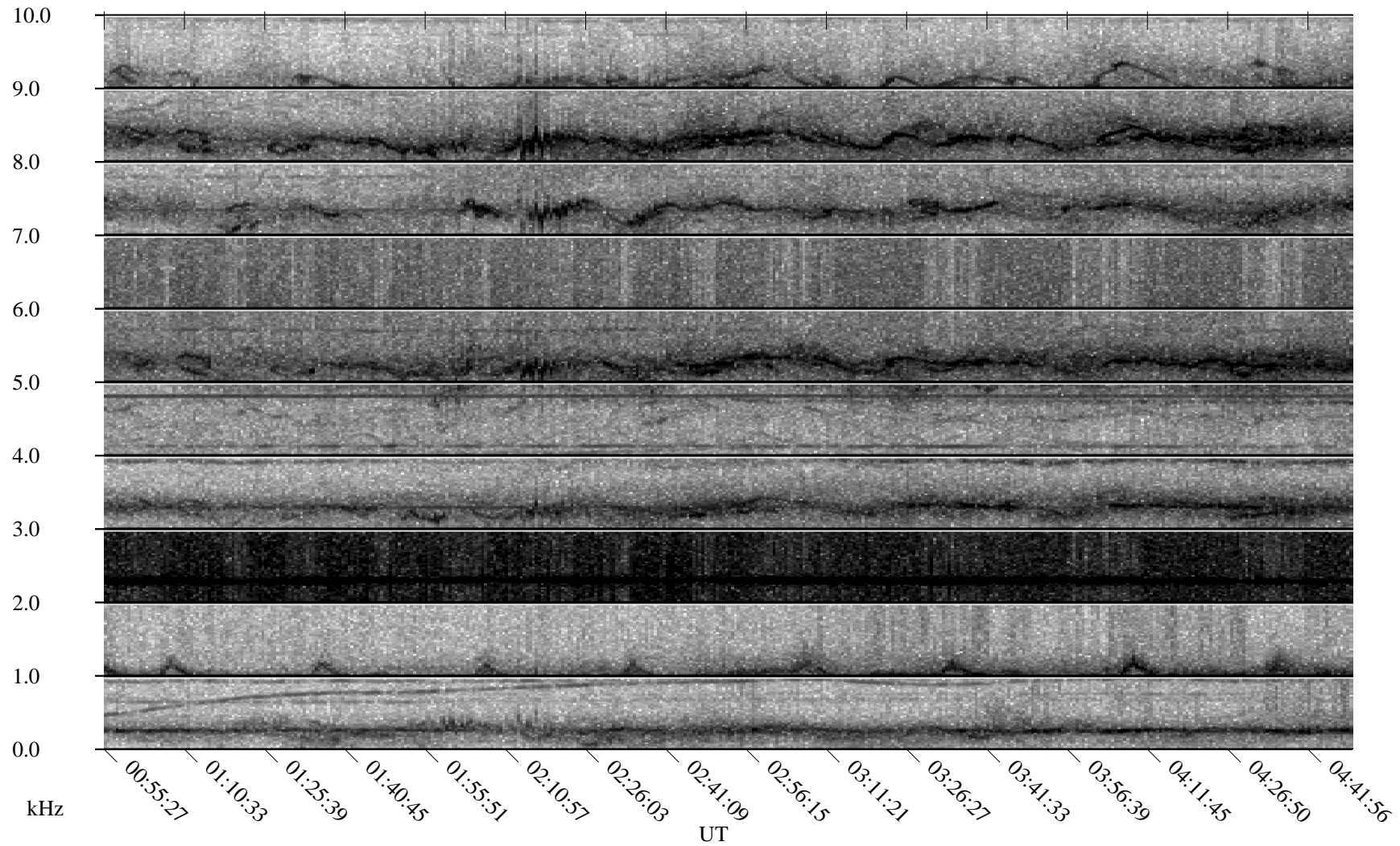


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Linear Scale Black = 1500 White = 700

AM Doppler data

Page 2



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AMD5 UMass Dartmouth

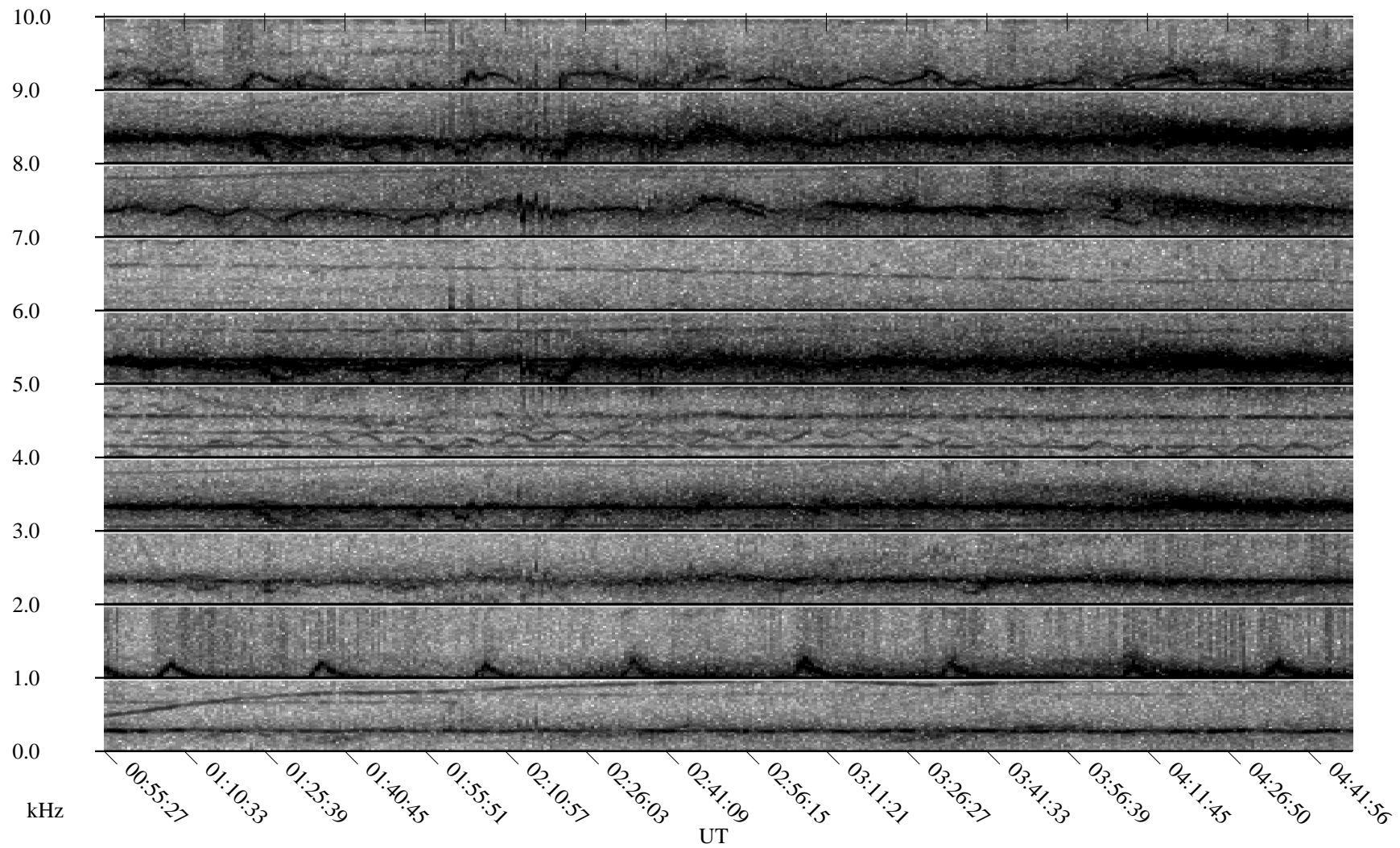


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Linear Scale Black = 1500 White = 700

AM Doppler data

Page 2



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20

Thank you.